

10043104-011402

1           1.    A semiconductor package, comprising:  
2           a substrate having a first surface and a second  
3 surface;  
4           a plurality of first grooves formed in the first  
5 surface, the plurality of first grooves forming a plurality  
6 of segments in the substrate;  
7           a plurality of semiconductor dice mounted to the  
8 second surface, each of the plurality of semiconductor dice  
9 being mounted to a corresponding segment;  
10          an encapsulant formed onto each of the plurality of  
11 semiconductor die, the encapsulant having a plurality of  
12 second grooves formed in the encapsulant to correspond with  
13 the plurality of first grooves; and  
14          a plurality of break points formed from the first  
15 and second grooves to separate individual ones of the  
16 plurality segments from the substrate.

1           2.    The semiconductor package of claim 1, wherein  
2 the substrate is formed from ceramic.

1           3.    The semiconductor package of claim 1, wherein  
2 the encapsulant is formed from a bismaleimide triazine  
3 resin.

1           4.    The semiconductor package of claim 1, wherein  
2 the plurality of first and second grooves are formed at an  
3 angle.

1           5.    The semiconductor package of claim 1, wherein  
2 the package is one of a ball grid array and a fine-pitched  
3 ball grid array package.

1           6.    The semiconductor package of claim 1, wherein  
2 the plurality of semiconductor dice are electrically  
3 connected to the substrate.

1           7.    A method for singulating a semiconductor  
2 package, comprising:  
3           providing a substrate having a first surface and a  
4 second surface;  
5           forming a plurality of first grooves in the first  
6 surface to separate the substrate into a plurality of  
7 segments.  
8           mounting a semiconductor die to each of the  
9 plurality of segments;  
10          forming an encapsulant over each of the segments,  
11 the encapsulant having a plurality of second grooves  
12 corresponding to the plurality of first grooves;  
13          forming a plurality of break points from the first  
14 and second grooves; and  
15          separating each of the plurality of segments from  
16 the substrate at a corresponding break point.

1           8.    The method of claim 7, wherein the package is  
2 one of a ball grid array and a fine-pitched ball grid array  
3 package.

1           9.    The method of claim 7, wherein the substrate is  
2 formed from a ceramic material.

1           10.   The method of claim 1, wherein the encapsulant  
2 is formed from bismaleimide triazine resin.

1 11. The method of claim 1, wherein the separating  
2 step comprises shearing or punching the plurality of  
3 segments from the substrate.

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